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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,444	02/24/2005	Ulrike Schulz	1-16931	3861

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EXAMINER	
PADGETT, MARIANNE L	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,444	SCHULZ ET AL.	
	Examiner	Art Unit	
	MARIANNE L. PADGETT	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-28 and 31-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-28 & 31-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. A **Request for Continued Examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's **submission** filed on 7/13/2009 has been entered.

Applicants' amendment to the claims have been entered, with it noted that the only claim amended was dependent claim 25, where the amendments thereto removed the 112 second rejection & objection to claims 25-26 as set forth in section 2 of the action mailed 4/13/2009. As all other claims remain the same as those finally rejected over art it that action, the art rejections are not affected by the amendment.

2. **Claims 16-28 & 31-33** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While the beginning of the independent claim 16 recites "A process **for reducing** the surface reflectance of **polymer substrates** to less than 2 %....with formation of **a refractive index gradient lay**er by means..." (emphasis added), it is noted that the actual process steps of ion bombardment only require "the ions impacting **at least one substrate surface**" (emphasis added), which has no necessary relationship to "polymer substrates" introduced in the first two lines of the claim, nor any requirement that the substrate(s) surface(s) being impacted by ions are polymeric, thus are not clearly related to the plural polymer substrates discussed in the first two lines of the claim. While the claimed language may imply that the circus being treated is a polymer surface, this is only a guess, not necessitated by the actual claimed language, hence cannot be considered to necessarily limit the claims, especially considering dependent claim language (claims 23, 25, 27 & 31-32), which uses open terminology ("comprises") to describe substrate materials. This lack of a necessary relationship is further reinforced in the last two

lines of claim 16 where "the ion bombardment is carried out until **a refractive index gradient layer**... has been formed" (emphasis added), which introduces a new limitation that has neither been clearly related to, nor differentiated from an analogous one introduced in line 3, due to use of the article "a" & otherwise undifferentiated language. For these reasons, for the claims as written, it is uncertain whether polymer surfaces are necessarily being treated or not. Note that the "for reducing..." of what is essentially the preamble cannot properly provide a necessary results for the process, without a clear & necessary relationship between the polymer substrate or substrates recited therein & the actual surface(s) ion bombarded.

Also note that while singular or plural substrate surfaces may be ion bombarded, is not clear whether that when plural surfaces are ion bombarded, they are on one substrate or plural substrates, especially noting the mismatch between the unclearly related plural "polymer substrates" & a singular or plural "at least one substrate surface". Also note discrepancies between independent claim & dependent claims' language, which would benefit from being made consistent throughout for purposes of clarity, where claim 18 recites "the substrate", claim 22 "the polymer substrates", claims 23 & 25 "the polymer substrate" & "the substrate", claims 24 & 26 "the substrate"; product by process claim 27 "A surface-modified substrate comprising a polymer", with dependent product claims 28 & 31-32, consistent with claim 27.

3. The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The **nonstatutory double patenting rejection** is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. **Claims 16-28 & 31-33** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Taniguchi et al**. (4,374,158).

Applicants' independent claim 16, while requiring the plasma ion source to necessarily contain both Ar & O_2, was previously noted to be consistent with the scope with respect to the teachings of **Taniguchi et al** (158)., since this possible meaning of the previously phrased limitation was already considered.

As previously set forth, **Taniguchi et al**. (158) teach making shaped or coated articles, that maybe optical articles, such as lenses or windows, etc., using a mixture of fine inorganic particles in a matrix material that may be polymeric compounds, such as methacrylic acid or polycarbonates or diethylene glycol bisallyl carbonate (CR39). The shaped or coated articles are taught to have been

suitably cured, then its surface is treated with activated gas containing ions, where those ions may have come from oxygen gas, argon or air (note air contains both O_2 & argon), where various types of plasma sources (DC, L.F., H.F., microwave at 10^{-2}-10 Torr) are mentioned as useful, particularly "cold plasma". The effective treatment is said to provide lower reflectance & higher transmittance, with exemplary transmittance values in table I including values over 97 or 98 %, where air or oxygen gas plasmas & times including 3 & 10 minutes (i.e. 180 & 600 seconds) were employed. Note that the taught transmittance values, necessitate reflectance values in claimed ranges, since over 98 % transmission means that the reflectance cannot possibly be more than 2 %. The thickness of the coating produced by the treatment was taught to be "up to 1000 milli-microns, preferably up to 500 milli-microns", which is taken to mean up to 1 μm or 1000 nm, preferably 500 nm. Particularly see, the abstract; col. 1, lines 5-10; col. 2, lines 20-46, esp. 37-46; col. 4, line 60-col. 5, line 44; col. 6, line 61-col. 7, line 52, esp. 25-41 & 50-52; Exs. on cols. 9-17, esp. table I on col. 17.

Taniguchi et al. differs from independent claim 16 by not providing information on the energies of the ions as they impinge on the substrate for the various plasmas employed, or discussing the presence of a refractive index **gradient**, and nor the wavelengths involved in the "total luminous transmittance" measurements, however as the optical articles under discussion include window panes, lenses, such as for spectacles, etc., the wavelengths would have been expected to at least encompass visible wavelengths, i.e. 400-700 nm, thus may be considered to cover values in the claimed range or the narrower dependent claim ranges. Alternatively, treatment with respect to these wavelengths would have been obvious to one of ordinary skill due to the products under consideration, which are generally exposed to such wavelengths & would reasonably have been expected & desired to not reflect light in the wavelengths which are required for their function, as such would detract from &/or distort the flight obtained through the taught optical articles. With respect to the gradient issue, a plasma *inherently* has ions with a distribution of energies therein, with lesser concentrations at the extremes of the ions' energy distribution.

When these ions impinge on the substrate surface, their individual depth of penetration is dependent on their individual energy, the angle of impingement, the composition of the particular substrate material (it's stopping power for particular ions of particular energies), and the like, hence there will *inherently* be a gradient associated with depth of ion penetration due to these old & well-known factors & the energy distribution, which will in turn *inherently* create a compositional gradient formed due to the distribution of penetrating ions & their affects, thus providing a reasonable expectation of such effects producing a graded refractive index layer, since the inherent energy distribution would inherently create a distribution of implantation depth that effects the refractive index by its distribution. With respect to energy, as noted by Taniguchi et al., the plasma conditions employed may be varied, dependent on shape of substrate, particular gas composition & substrate composition, etc., where the reference explicitly suggests that optimum conditions may be readily obtained by experimentation, thus it would've been obvious to one of ordinary skill in the art to conduct such suggested experiments for particular plasma sources used with particular compositions being treated, in order to optimize the parameters, such as energy, time & pressure, with reasonable expectation that such parameters will include various energies, times & pressures as claimed by applicants, due to analogous treatments of analogous substrates for like results. It is noted that this is especially relevant to applicants independent claim 16 which is treating generic substrate surfaces of no particular material, which may or may not be associated with generic "polymer substrates", which when further defined in some dependent claims, the substrate need only "comprise" claimed polymeric material. Particular ion parameters when applied to generic material or generic polymers, or specific polymers comprising unspecified other materials, can not be considered to necessitate any inherent or specific effects, but even specific materials would be relevant to the routine experimentation teachings.

In the paragraph bridging p. 6-7 of applicants' 10/30/2008 response, applicants asserted that in their process of independent claim 16, the process is treating a substrate "which is completely made of an

organic polymer without any enclosed other elements...", however this was & remains incorrect, since the generic claim of independent claim 16 of "polymer substrates" neither explicitly includes, nor explicitly excludes the inclusion of non-polymer additives in the generic polymer substrate, and the actual surface being treated need not be polymeric for the claims **as presently written**. Furthermore, applicants' dependent claims 23, 25 & 31-32 that further describe the polymer substrate **include language**, which **explicitly enables** one to add any other additives or composites (multilayers, patterns, etc.) of materials, inclusive of organic or inorganic, as desired, as the claims use language such as "the polymer substrate **comprises**..." (emphasis added), thus including the possible use in such polymer substrates of additives such as the find inorganic particles employed by Taniguchi et al., such that applicants' claims cannot be said to exclude the processes taught therein.

5. **Claims 16-28 & 31-33** are provisionally rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-7, 12-18 & 24-25 of copending Application No. **11/662,550**.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim limitations of the two applications are directed to processes of overlapping scope, with the limitations claimed in different orders, such that they are obvious variations on like themes. It is noted copending (550)'s claims have additional limitations directed to deposition of a metal layer, however the presence of such a layer is neither required nor excluded by the present claims, hence is not considered a relevant issue for the claims *as presently written*. In copending (550), for examples of overlapping limitations, see claims 1-4 for method of making an optical element including graduated refractive index, with claim 3 directed to thicknesses $\geq$ 50 nm; claim 5 employing plasma with energies $\geq$ 100 eV; claim 6 employing Ar & O_2; claim 7, times $\geq$ 200 seconds; claim 12 treating both sides of an optical substrate; claim 13 for treated substrates being PMMA or CR39; claim 14 for less than 1.5% reflectance in spectral ranges from 400-1100 nm, etc.

Applicants' previous arguments (page 7 of 10/30/08 response) with respect to this rejection, appeared to rely on semantics differences, since copending case 11/662,550's claim to "a radiation-absorbing optical element...", may certainly be considered to encompass or be equivalent to "reducing the surface reflectance of an optical element...", especially when one considers that the products & processes of these two applications employ the same types of plasmas ($(Ar + O_2)$ copending claim 6); may use the same energies (copending claim 5); may apply the plasmas to the same substrate materials (copending claim 13) in order to obtain like results with respect to the refractive index gradient layer formed (claim 14), hence applicants' arguments were utterly unconvincing. As noted, the application of the metal layer in independent claim 1 of the copending case (550) is not significant to the obviousness double patenting, as the present claims do not prohibit the deposition of such a layer on top of the refractive index gradient layer after it is formed.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. **Other art** of interest that was previously cited for ion treating of the polymeric materials to increase transmission &/or reduce reflectance included: **Ogami**, JP 2008-209442 A, which while not prior art, is directed to plasma or ion beam processing of a resin film to reduce the transmittance at 400-700 nm wavelengths & to create a multilayer absorption structure for optical purposes; **Tregub et al.** (7,314,667 B2), who fluorinate with ion beams or plasma; **Strangl et al.** (4,868,162), who implanted metal ions from liquid sources (In or Sn) or O^+ from a "duoplasmatron", using energies of about 10 keV to locally increase transmission of a filter layer that may be PMMA or PET (col. 6, lines 22-68); and **He et al.** (6,572,935 B1), who bias the substrate (PMMA, polycarbonate, or glass) & treat with plasma containing C, H & Ar to increase transmission thereof. The related copending case to **Schulz et al.** (6,645,608 B2), which has overlapping inventors, was cited as of interest, but reduces reflectance therein the use of inorganic oxide layers.

7. Applicant's arguments filed 7/13/2009 & discussed above have been fully considered but they are not persuasive.

On page 6 of applicants response, in their remarks applicants discuss "Claim 16, as amended...", however **no amendments have been made** to claim 16 & all limitations which applicants repeat in this discussion have already been discussed. Applicant's discussion on of inorganic particles contained in the Taniguchi et al.'s, as has previously been indicated is **totally irrelevant** to applicants' claims **as written**, because applicants even after having pointed out that their claims are not limited to only polymeric materials in their substrates or on the substrate surfaces, have not amended their claims to eliminate such possibilities. As also discussed above, applicants recitation of specific ion bombardment parameters when applied to generic materials (possibly polymeric, but where treated substrate' surfaces need not even be polymeric), which may comprise unlimited other materials, cannot be considered to have any patentable significance in view of the lack of context or clearly set forth material to which the ion bombardment is applied. Furthermore, even if the substrates were necessarily limited entirely to polymeric material, applicants had not provided any evidence that all polymeric materials will be affected in the same manner by the claimed ion bombardment, thus not providing patentable significance to claimed ion bombardment of all polymers.

Also note that applicant's claim language does not specify any particular microstructure for the refractive index gradient layer produced by applicants' claimed ion bombardment, thus encompassing any microstructure that may produce any refractive index gradient effect in a layer & does not exclude surface layers as produced in the process of Taniguchi et al. as discussed above, especially considering that polymer substrates, **as presently claimed**, encompass composite substrates such as those treated the ion bombardment by the above applied reference.

With respect to the obviousness double patenting (ODP) rejection, applicants argue that the present applications earlier filing date means that no obviousness double patenting rejection is warranted,

this is incorrect, since as long as both cases are pending & the case under consideration is not otherwise allowable (which it is not), the obviousness double patenting rejections when appropriate should properly be made. Other arguments with respect to the ODP rejection appear to merely repeat previous arguments, thus fail to be convincing.

8. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

MLP/dictation software

9/23/2009